360° or 720°). If the direction of orientation treatment is at right angle to folding line **5** as shown in FIG. **23**(*a*), the liquid crystal cell has an orientation angle of 180° (or for example, 540° or 900°) as shown in FIG. **23**(*b*).

It is of course possible to turn direction A by 180° or provide orientation treatment which is parallel to folding line **5** as shown in FIGS. **17**(*a*) and **22**(*a*), or which has a right angle to foldling line **5** as shown in FIGS. **16**(*a*) and **23**(*a*).

Reference is now made to a twisted nematic type liquid crystal panel having a polarizer on each side of a liquid crystal layer as shown in FIGS. **24**(*b*) and **25**(*b*). For the sake of simplicity, description will be made of a device in which a polarizer D is incorporated into the device described above with reference to FIGS. **12**(*a*) and **12**(*b*). Polarizer D has an absorption axis E which extends in parallel to direction of orientation treatment A as shown in FIG. **24**(*a*), or which has a right angle thereto as shown in FIG. **25**(*a*).

In the device obtained by folding substrate sheet **1** of FIG. **24**(*a*), direction of orientation C of the upper portion of liquid crystal layer **4** and absorption axis G of polarizer D on the upper side of the liquid crystal cell are in parallel to each other. Both are at substantially right angles or between 80° and 100° to direction of orientation B of the lower portion of liquid crystal layer **4** and absorption axis F of polarizer D on the lower side of the liquid crystal cell which are in parallel to each other. Thus, the liquid crystal material is orientated in a twisted pattern, and the changes caused in the orientation of liquid crystal material **4** upon the application of a voltage thereacross provides a display by alternating the transmission and shielding of the incident light subjected to linear polarization by polarizers D in the usual manner.

In the device obtained by folding substrate sheet **1** shown in FIG. **25**(*a*), direction of orientation C of the upper portion of liquid crystal layer **4** is at a right angle to absorption axis G of polarizer D on the upper side of the liquid crystal cell, and direction of orientation B of the lower portion of liquid crystal layer **4** is at a right angle to absorption axis F of polarizer D on the lower side of the liquid crystal cell as shown in FIG. **25**(*b*). Thus, the changes caused in the orientation of liquid crystal material **4** upon application of voltage thereacross provides a display by alternating the transmission and shielding of incident light subjected to linear polarization by polarizers D in the usual manner.

A variety of EXAMPLES hereinabove have been described and include the liquid crystal display panel utilize normal light, and also those which utilize polarized light.

It will thus be obvious that the arrangements of FIGS. **24**(*a*) and **24**(*b*) or **25**(*a*) and **25**(*b*) are applicable to the devices of FIGS. **13**(*a*) and **13**(*b*), **14**(*a*) and **14**(*b*), **15**(*a*) and **15**(*b*), **16**(*a*) and **16**(*b*), **17**(*a*) and **17**(*b*), **18**(*a*) and **18**(*b*), **19**(*a*) and **19**(*b*), **20**(*a*) and **20**(*b*) or **21**(*a*) and **21**(*b*) to produce a field effect type liquid crystal display device.

It will also be noted that the polarizer D itself may form the substrate sheet. It is also possible to use a substrate sheet having polarizing properties. Moreover, the substrate sheet and polarizers can be formed into a unitary body. If the substrate has polarizing properties, or forms a unitary body with polarizers to provide polarizing properties, the substrate may be treated for orientation at an angle to the absorption axis of the polarizer, and then folded to form the liquid crystal display device. If the substrate and the polarizers are separated from each other, the polarizers are joined with the substrate so that the absorption axis E thereof may have a predetermined angle, and the substrate is treated for orientation at a predetermined angle to the absorption axis E of the polarizers.

The liquid crystal panel of this invention constructed as hereabove described has a number of advantages over the conventional device. It is inexpensive, since it does not require any conductor of the type hitherto required in view of the hardness of the glass substrates in the conventional device, and therefore, does not require any printing and drying work for the conductor. The elimination of any such conductor also makes the device of this invention highly reliable, since the conductor, which has been composed of an adhesive containing silver powder or the like, is low in resistance to changes in environmental conditions, such as temperature and humidity, and a resistance to a mechanical impact and is likely to cause the loss of electrical continuity.

It will thus be seen that the objects set forth above, and those apparent from the preceding description are effectively attained and since certain changes may be made in the above construction and process without departing from the spirit and scope of the invention it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A liquid crystal display device comprising a folded substrate sheet having an upper planar portion and an opposed lower planar portion spaced apart and parallel to each other and a fold line between the planar portions, a sealing material disposed about the perimeter of the opposed portions of the substate sheet for defining a space, liquid crystal material sealed in the space, each facing portion of the substrate sheet having cooperating electrode patterns formed thereon for applying a voltage therebetween across the liquid crystal material to render selected portions visually distinguishable from the remaining material, one of said electrode patterns on one of the opposed substrate portions extending about the fold line between the substrate portions to the edge of the other substrate portion.

2. The liquid crystal display device of claim **1**, wherein one of the opposed portions of the substrate sheet extends further from the fold line than the other of said portion of the substrate sheet to define a terminal region, the electrodes on both opposed portions extending to the terminal region.

3. The liquid crystal display device of claim **2**, wherein the electrode pattern on the opposed substrate portion extending further from the fold line is a signal electrode pattern and the electrode pattern on the other planar portion is a common electrode pattern, the common electrode pattern extending across the fold line to the terminal portion.

4. the liquid crystal display device of claim **3**, wherein the electrode patterns on each opposed substrate portion extends substantially parallel to the fold line.

5. The liquid crystal display device of claim **1**, wherein the opposed portions of the substrate sheet